

## A NEW SPECIES OF *ASPIDOSIPHON* (SIPUNCULA) FROM THE WESTERN ATLANTIC OCEAN

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*Abstract.*—A new species of Sipuncula, *Aspidosiphon* (*Aspidosiphon*) *gosnoldi*, is described. This form had earlier been identified erroneously as *Aspidosiphon spinalis* by Cutler (1973) and Cutler and Cutler (1979). It has been collected off the southeastern U.S., Bahamas, and Brazil at depths between 7 and 185 m.

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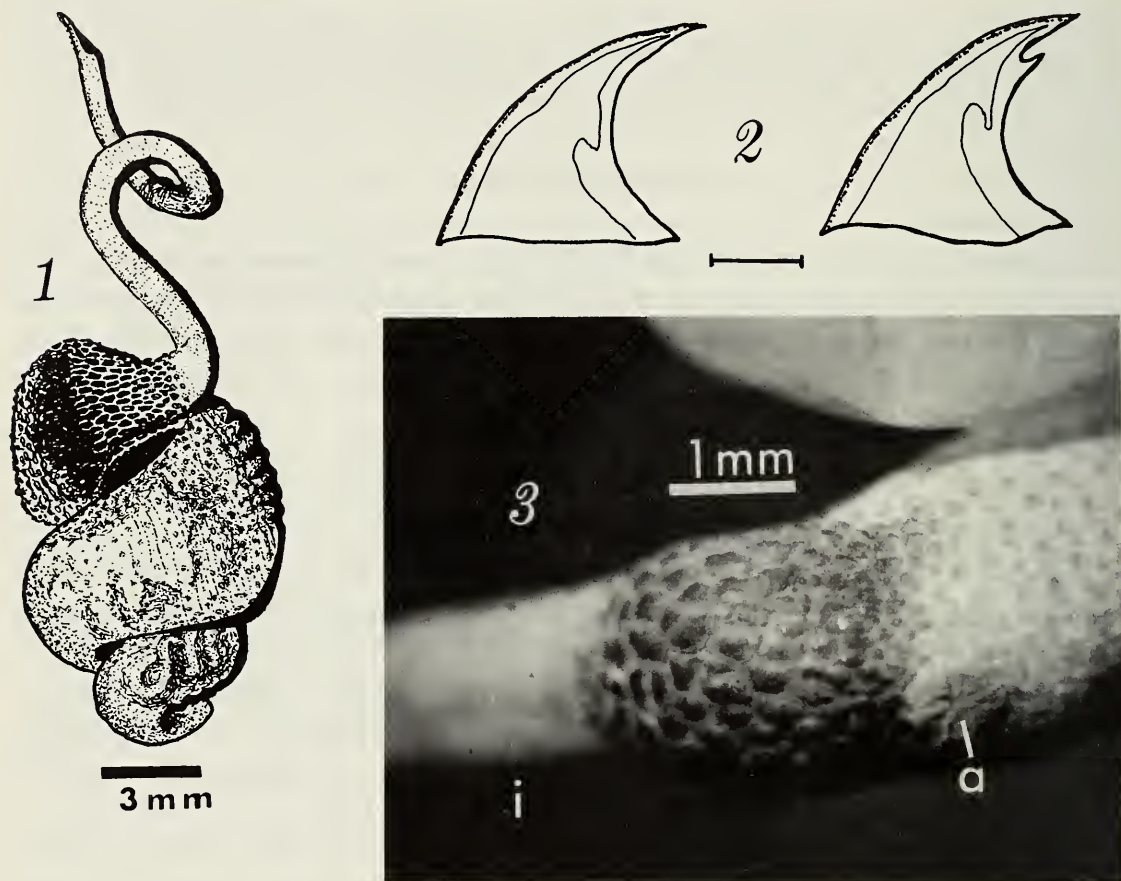
In Cutler (1973), and Cutler and Cutler (1979) the name *Aspidosiphon spinalis* Ikeda (1904) was used for two populations of western Atlantic Ocean worms. It was noted (Cutler, 1973:175), "This identification is made with some reservations because no specimens of Ikeda's material are available for comparison and his illustrations are not very clear." After spending several months in Japan examining that fauna and reevaluating the species described by Ikeda and Sato (Cutler and Cutler, 1981) it became clear to me that I had misused that name; i.e., the animals from the Atlantic Ocean were different from those Ikeda looked at. *Aspidosiphon spinalis* is now considered to be a junior synonym of *A. elegans*. Much of the confusion centered around the meaning of the term "spine." This is discussed in more detail in Cutler and Cutler (1981). The word spine has been used for two different kinds of structure: (A) large, conical, curved in side view, dark brown structures; (B) small, unpigmented, gently curved, single-pointed hooks. We have restricted our usage of spine to type A, such as those present in *A. elegans*, and call type B unidentate hooks, such as those present in this species. Consultation with Mary Rice (Smithsonian Institution) and examination of the existing literature has led me to conclude that these animals represent a new species.

*Aspidosiphon* (*Aspidosiphon*) *gosnoldi*, new species

Figs. 1—4

*Aspidosiphon spinalis* Ikeda.—Cutler, 1973:175–176, fig. 48–49.—Cutler and Cutler, 1979:107.

*Description.*—As almost all of these worms are coiled, having lived in gastropod shells, it is difficult to obtain accurate measurements (Fig. 1). They are commonly from 5–15 mm long but range from approximately 2–22 mm. The color is cream or pale tan with shields that vary from light to dark



Figs. 1–3. *Aspidosiphon gosnoldi*: 1, External view, introvert incomplete (from Cutler, 1973); 2, Unidentate and bidentate hooks from the introvert (scale 10  $\mu$ m); 3, Anterior end of trunk, showing anal shield (a, anus; i, introvert).

brown. In larger animals, the anterior third of the trunk appears brownish because of the development of darker cuticular plaques around the papillae. A few worms have commensal endoprocts, and others have commensal polychaetes living with them in the shells.

The introvert is 2–3 times the trunk length, and its diameter decreases near the end just behind the tentacular crown which is composed of 8–10 small, finger-shaped tentacles. No introvert was completely extended so no comment can be made about tentacle position. The distal 10–20% bears 25–60 complete rings of hooks followed by a short transition zone of incomplete rings, and eventually the hooks are scattered over most of the remainder of the introvert. The hooks near the distal end have secondary points while the remainder are unidentate (Fig. 2) and both are about 22–26  $\mu$ m tall. The introvert also carries cylindrical papillae (15–17  $\mu$ m tall) between the hook rings.

The anal shield is composed of large, brown, close-set, polygonal, randomly arranged, chitinous subunits (Fig. 3). In general, it has well-defined



Table 1.—A comparison of the known distribution of 3 similar *Aspidosiphon*.

Ocean	<i>A. gosnoldi</i> W. Atlantic	<i>A. misakiensis</i> W. Pacific	<i>A. gerouldi</i> E. and W. Atlantic
Latitudes	24–35°N and 23°S	25–35°N	8°S–16°N
Common depth	10–100 m	0–5 m	5–30 m

limits. The caudal shield, composed of scattered chitinous papillae is generally paler and less well defined. These papillae give a suggestion of a radial arrangement.

Internally the longitudinal musculature is continuous except that a few larger worms show a suggestion of separate bundles, particularly just behind the anal region. The 2 retractor muscles originate from the posterior end of the body at the border of the caudal shield and merge to form one muscle before inserting in the anterior end. These 2 muscles remain separate for about 35–50% of the total length. The coiled intestine is anchored at both ends by the spindle muscle but fixing muscles were not seen. The anterior attachment of the spindle muscle is on the body wall just anterior to the anus. The pale nephridia are about half the length of the body and are fixed to the body wall by connective tissue for much of their length.

*Relationships.*—This species is in the group of *Aspidosiphon* (*Aspidosiphon*) which have both bidentate and unidentate hooks, 2 retractor muscles originating near or on the posterior end of the trunk, an ungrooved anal shield, and lack dark, conical, spinelike papillae on the base of the introvert. This group now includes only *A. gerouldi* and *A. misakiensis*. *A. gosnoldi* differs from *A. gerouldi* in that its anal shield is much less compact, made up of units which are spread apart, while *A. gerouldi* has one which is compact and granular with the subunits fused. The caudal shield of *A. gerouldi* is also more distinct and grooved. The difference from *A. misakiensis* also lies in the nature of the anal shield (*A. misakiensis* being again more compact and coarse). The longitudinal muscle layer of *A. misakiensis* very often exhibits fractures or splits in it other than just in the anal region. These three species are geographically separate populations with some differences in habitat preference (Table 1). When one looks at representatives of these three populations, they do look different but it becomes difficult to articulate those differences precisely. It is possible that additional analyses with more sophisticated techniques will show these forms to be conspecific.

The name of this new species acknowledges the vessel used by the U.S. Geological Survey to collect most of these animals, the R/V *Gosnold*. The holotype is from Sta. 1692, 12 June 1964, 29°30'N, 80°29'W, 32 m, and is deposited at National Museum of Natural History, Smithsonian Institution, USNM 61624. Paratypes are from R/V *Eastward* St. 1439, collected by I.

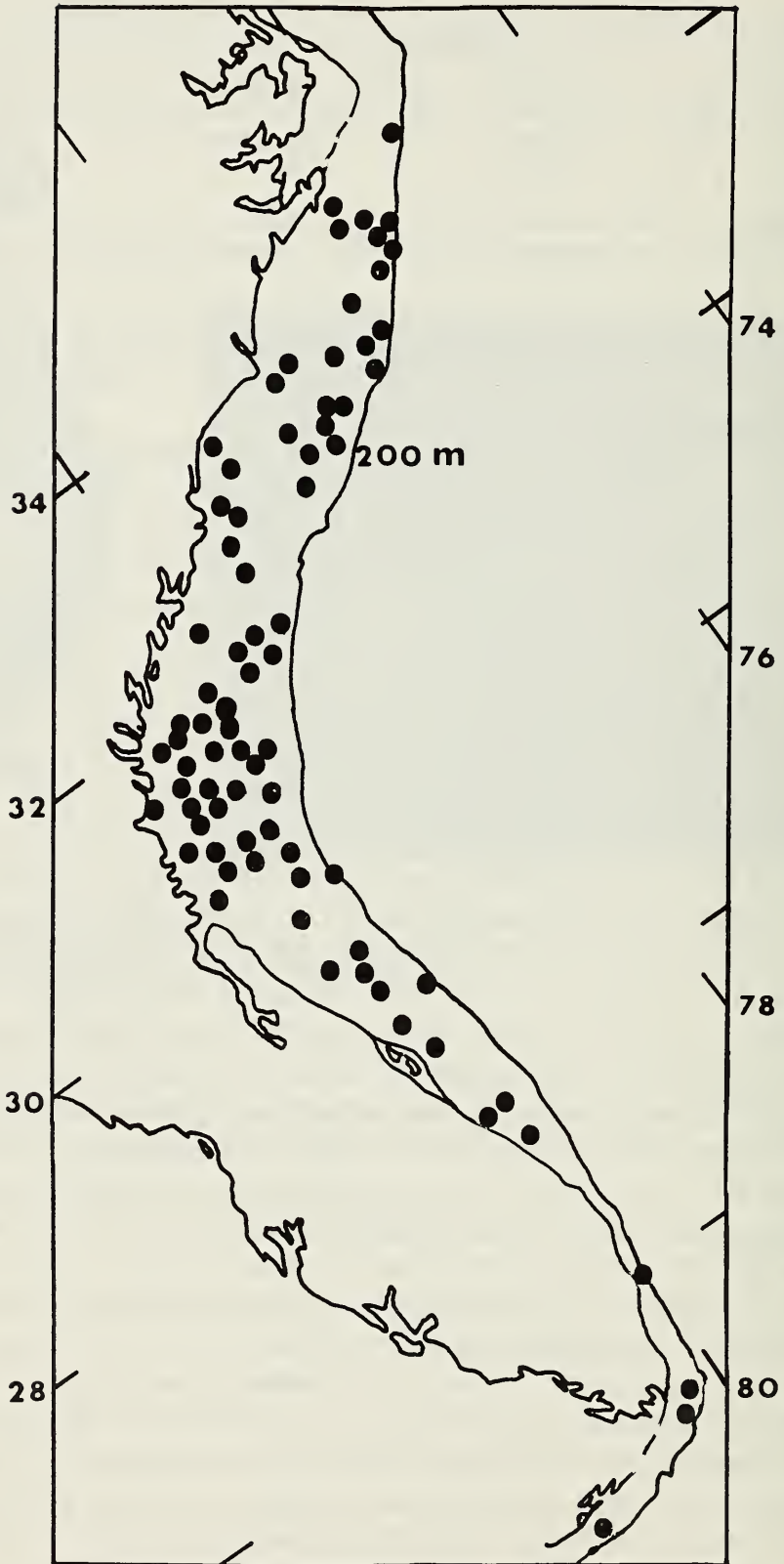


Fig. 4. Recorded occurrences of *Aspidosiphon gosnoldi* off the southeastern United States. For records in the Bahamas and Brazil, see text.

E. Gray and L. McCloskey, 21 May 1965, 34°59'N, 75°28'W, 100 m, USNM 61625.

*Distribution.*—In the Northern Hemisphere (Cutler, 1973, 287 specimens from 103 stations) this species inhabits the continental shelf from Cape Hatteras to the Florida Keys (Fig. 4). The known latitudinal range is from 24°27' to 35°00'N. Seventy-one percent of the records are from depths less than 35 m, 17% between 35–85 m, and 12% greater than 85 m. The known depth range is 7–185 m; the temperatures range from 15–28°C. Most of these animals live in empty mollusk shells. One previously unpublished record is of 2 worms collected by B. Thomassin from the Bahamas in 1974, seaward reef slope in sand at 15 m. The southern population (Cutler and Cutler, 1979) is known from 2 stations off Brazil (23°S) at 103 m (11 specimens) and 25 m (1 specimen) collected by the *Calypso*.

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